

II. ISSUES RELATING TO PRIOR ART

A. CLAIMS 1, 2, 11, 15-20, 24, AND 28

Claims 1, 2, 11, 15-20, 24, and 28 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,944,663 to Schuba, et al. (“Schuba”) in view of U.S. Patent No. 6,321,339 to French, et al. (“French”). The rejection is respectfully traversed.

The Combination

Schuba and French are not properly combined in this rejection under 35 U.S.C. § 103(a) because the Office Action fails to adduce sufficient evidence of a motivation to combine the cited references by a person of ordinary skill in the art. The Office Action indicates, in the Response to Arguments p26, that “whether the prior art states that it would be useful for the same purpose or not useful for the same purpose as the applicant’s claimed invention is not a persuasive argument, **since [French] is still a proof of work approach . . .**” Thus, the Office Action combines Schuba and French based on the assumption that both Schuba and French are proof of work approaches. However, French is not a proof of work approach.

French describes a network **authentication system** that generates digital certificates to users based on a hierarchy of queries **requesting identity information** from the users. (See French, Abstract.) Thus, the authentication system of French does not require proof of work, but **proof of identity**. The combination of Schuba and French is improper, as the rationale behind the alleged proper combination asserted by the Office Action is unsupported by adequate evidence from the references or any other source.

Therefore, it would not have been obvious to one of skill in the art to combine methods of proof of identity from French with methods of proof of work from Schuba.

Claim 1

Claim 1 recites:

A method of preventing an attack on a network, the method comprising the computer-implemented steps of:

**receiving a request to access a resource from a user, wherein the request includes an accumulated work value;**  
**wherein the accumulated work value represents a total amount of work previously performed by the user and accumulated across multiple prior requests by the user;**  
**determining whether the accumulated work value exceeds a required work threshold value, and if not, requiring the user to perform a quantity of work as a condition for accessing the resource;**  
providing the user with access to the resource;  
**determining an amount of accumulated work output value to provide to the user based on a volume of data communicated between the resource and the user;**  
**and**  
**wherein the accumulated work output value represents a second amount of work performed by the user;**  
**providing the accumulated work output value to the user.**

At least the above-bolded features of Claim 1 would not have been obvious in view of Schuba or French, even when taken in combination under 35 U.S.C. § 103(a). To establish a prima facie case of unpatentability, the Office must provide “some articulated reasoning **with some rational underpinning** to support the legal conclusion of obviousness.” MPEP 2142 (citing KSR International Co. v. Teleflex Inc., 550 U.S. 398 (2007)). As shown below, the Office has not provided a sufficient factual basis to support a conclusion that Claim 1 would have been obvious in view of Schuba and French.

The Office Action cites Schuba Col 3 Lines 52-58 for disclosing “receiving a request to access a resource from a user, wherein the request includes an accumulated work value” recited by Claim 1. This is incorrect.

The cited portion of Schuba describes a system that “receives a request for service from a client,” and in response to the request, the system generates a random number and “selects a value for the parameter, n, which specifies the amount of computational work involved in computing the preimage x.” In Schuba Col 3 Lines 59-60, the system stores the random number and the parameter, n, at a server and then **sends those values to the client**. The client then is allowed to compute the preimage, x, and the system receives x from the client. (See Schuba Col 3, Lines 61-62 and Col 4, Line 20).

The Office Action alleges, in the Response to Arguments p27, that “Schuba does suggest an amount of computational work involved to be computed where it would have been reasonable to expect any amount of computational work to be computed.” The Office Action **fails to support with evidence** the assertion that it “would have been reasonable to expect any amount of computational work to be computed.” The Office Action has merely made a conclusory statement with no rational underpinning for why the asserted extension of Schuba would have been reasonable, or would have provided the claimed combination.

The system of Schuba does not teach an accumulated work value as recited by Claim 1, nor does Schuba disclose **any work value at all** included in a request to access a resource from a user. Schuba describes a request for service from a client, and, in turn, the system of Schuba requests work from the client. Thus, any work value described in Schuba is not included in a request to access a resource from a user, as recited by Claim 1. As such, Schuba fails to teach or suggest “receiving a request to access a resource from a user, **wherein the request includes an accumulated work value**” recited by Claim 1. It is not even alleged that French teaches this feature of Claim 1.

The Office Action cites French Col 14 Lines 1-14 for teaching “wherein the accumulated work value represents a total amount of work previously performed by the user and accumulated across multiple prior requests by the user,” as recited by Claim 1. This is incorrect.

The cited portion of French describes a “transaction record” that is used to “keep track of user input and authentication results.” The authentication results in the transaction record “may . . . be combined with the results of second level authentication . . . to determine an overall authenticity certainty score.” The Office Action, in the Response to Arguments p27, states that French suggests “utilizing a form of authentication score which is tracked.” In contrast, Claim 1 recites an accumulated work value that “represents a total amount of work previously performed by the user and accumulated **across multiple prior requests by the user**,” and this is not taught or suggested by French. French’s process of authentication involves queries that are directed **from the server to the client**. Thus, French fails to teach or suggest “multiple prior requests **by the user**” as recited by Claim 1. Furthermore, the “accumulated work value” recited in Claim 1 is included in “a request to access a resource” sent by a user. The transaction record, or any other value described in French, is not **included in a user request** as recited by Claim 1. Thus, French fails to teach or suggest “wherein the accumulated work value represents a total amount of work previously performed by the user and accumulated across multiple prior requests by the user,” as recited by Claim 1, even when taken in combination with Schuba under 35 U.S.C. 103(a).

The Office Action cites Schuba Col 4 Lines 35-39 and Col 3 Lines 50-52 for teaching “determining whether the accumulated work value exceeds a required work threshold value, and if not, requiring the user to perform a quantity of work as a condition for accessing the resource,” as recited by Claim 1. This is incorrect.

Col 4 Lines 35-39 of Schuba describes verifying a client’s solution of a puzzle, and Schuba Col 3, Lines 50-52 describes using a client puzzle. The Office Action, in the Response to Arguments p28, indicates that Schuba suggests “a proof of work/puzzle type of solution where a client successfully solving a puzzle implies that whatever the threshold is set as, it has been met or exceeded since the puzzle was completed correctly.” In so stating, the Office Action apparently interprets the description of a client solving a puzzle in Schuba to be the accumulated work value of Claim 1. However, Claim 1 states that the accumulated work value is included in

“a request to access a resource from a user.” The puzzle solution of Schuba is not included in a request **to access a resource** from a user. Furthermore, the solution of a puzzle described in Schuba is not sufficient to teach or suggest determining whether an accumulated work value **received in a request to access a resource** from a user exceeds a required threshold value, as recited by Claim 1. Schuba has no suggestion for a user to solve multiple puzzles and to present, in a request, evidence of the work performed in solving multiple puzzles. Thus, Schuba fails to teach or suggest the above-cited features of Claim 1. It is not even alleged that French discloses this feature of Claim 1.

The Office Action cites Schuba Col 3 Lines 53-58 for teaching “determining an amount of accumulated work output value to provide to the user based on a volume of data communicated between the resource and the user” recited by Claim 1. This is incorrect.

As previously stated, the Col 3 Lines 53-58 of Schuba describes a system that generates a random number and “selects a value for the parameter, n, which specifies the amount of computational work involved in computing the preimage x” in response to a client request. The Office Action indicates, in Response to Arguments p28, that Schuba suggests “an amount of computation work to be performed based on a formula where it is reasonable to expect a variety of inputs that are used as part of the calculation.” This is incorrect. The Office Action has merely made a conclusory statement with no rational underpinning, insufficient to satisfy the KSR test.

Schuba fails to teach or suggest basing “an amount of accumulated work output value . . . on a **volume of data communicated between the resource and the user**” as recited by Claim 1. In citing Col 3 Lines 53-58 of Schuba, the Office Action interprets the variables prepared, by the system, to be sent to a user in a request for the user to perform work, as described in Schuba, to be the “volume of data communicated between the resource and the user” recited by Claim 1. However, the variables described in the cited portion of Schuba are the following: a random number, a transaction identifier, and a measure of the amount of computational work that goes into solving a puzzle. None of these teach or suggest **a volume of data** communicated between a

resource and a user, as recited by Claim 1. Thus, Schuba fails to teach or describe the above-cited feature of Claim 1. It is not even alleged that French discloses this feature of Claim 1.

The Office Action cites French Col 14 Lines 1-14 for teaching “wherein the accumulated work output value represents a second amount of work performed by the user” recited by Claim 1. This is incorrect.

As previously discussed, this portion of French describes a “transaction record” that is used to “keep track of user input and authentication results.” The authentication results in the transaction record “may . . . be combined with the results of second level authentication . . . to determine an overall authenticity certainty score.” The Office Action indicates, in the Response to Arguments p28, that “it is reasonable to expect that if a user performs computations for one amount of work, they could perform any additional amount of computation of work,” but fails to support this assertion with evidence. With respect to the above-cited feature of Claim 1, the Office Action has merely made a conclusory statement with no indication of a rational underpinning sufficient to meet the evidentiary burden required under KSR.

As previously discussed, French describes personal authentication of a user, and not a user performing “computations for one amount of work,” as alleged by the Office Action. As such, French certainly fails to teach or suggest performing “any additional amount of computation of work,” as alleged by the Office Action. Furthermore, the transaction record that keeps track of user input described in French is not sufficient to teach “a second amount of work performed by the user” that is **“based on a volume of data communicated between the resource and the user”** as recited by Claim 1. Thus, French fails to teach or describe “wherein the accumulated work output value represents a second amount of work performed by the user” recited by Claim 1, even when taken in combination with Schuba under 35 U.S.C. 103(a).

The Office Action cites Schuba Col 3 Lines 55-58 for allegedly teaching “providing the accumulated work output value to the user” recited by Claim 1. This is incorrect.

The cited portion of Schuba describes specifying an “amount of computational work involved in computing a preimage.” The Office Action indicates, in the Response to Arguments p29, that “it is reasonable to expect an amount of calculated work that is a culmination of different accumulated variables for a user to perform a proof of work on,” but again fails to support this assertion with evidence. Applicants interpret this statement of the Office Action as interpreting the “accumulated work output value” of Claim 1 as a “culmination of different accumulated variables.” This is incorrect. The Office Action has merely made a conclusory statement with no rational underpinning that might be adequate under KSR.

The cited portion of Schuba does not disclose an “accumulated work output value” recited by Claim 1. Furthermore, there is no evidence that Schuba teaches or suggests “a culmination of different accumulated variables,” as alleged by the Office Action. This allegation is wholly unsupported by the art of reference. Therefore, Schuba fails to teach or suggest “providing the accumulated work output value to the user” recited by Claim 1. It is not even alleged that French teaches this feature of Claim 1.

For at least these reasons, Claim 1 is patentable over Schuba and French, even when taken in combination under 35 U.S.C. §103(a).

#### Claim 16

Claim 16 recites:

A method of preventing an attack on a network, the method comprising computer-implemented steps of:

**receiving a request to access a resource from a user, wherein the request includes an accumulated work value that represents work that the resource has previously required the user to perform in order to obtain previous access to the resource;**  
**determining whether the accumulated work value exceeds a required work threshold value; and**

**providing the user with access to the resource only when the accumulated work value exceeds a required work threshold value.**

At least the above-bolded features of Claim 16 are not made obvious by Schuba or French, even when considered in combination under 35 U.S.C. § 103(a). As shown below, the Office has not provided a sufficient factual basis to support a conclusion that Claim 16 is obvious in view of Schuba and French.

The Office Action cites Schuba Col 3 Lines 52-53 for allegedly teaching “receiving a request to access a resource from a user,” and French Col 14 Lines 1-14 for disclosing “wherein the request includes an accumulated work value that represents work that the resource has previously required the user to perform in order to obtain previous access to the resource,” as recited by Claim 16. This is incorrect.

French Col 14 Lines 1-14 describes a “transaction record” that is used to “keep track of user input and authentication results.” The authentication results in the transaction record “may . . . be combined with the results of second level authentication . . . to determine an overall authenticity certainty score.” The Office Action indicates, in the Response to Arguments p29, that “French suggests keeping track of authentication scores of a user to determine if the user has previously been successfully authenticated.” Nevertheless, French fails to teach or suggest **a request that “includes** an accumulated work value that represents work that the resource has previously required the user to perform in order to obtain previous access to the resource,” as recited by Claim 1.

The cited portion of Schuba describes a system that “receives a request for service from a client.” However, Schuba fails to teach or suggest a request from a client that **“includes an accumulated work value** that represents work that the resource has previously required the user to perform in order to obtain previous access to the resource,” as recited by Claim 16. Thus, French and Schuba, taken in combination under 35 U.S.C. § 103(a), fail to teach or suggest “receiving a request to access a resource from a user, **wherein the request includes an**



**accumulated work value** that represents work that the resource has previously required the user to perform in order to obtain previous access to the resource” recited by Claim 16.

The Office Action cites Schuba Col 4 Lines 35-39 for allegedly teaching “determining whether the accumulated work value exceeds a required work threshold value” recited by Claim 16. This is incorrect.

As previously stated, Col 4 Lines 35-39 of Schuba describes verifying a client’s solution of a puzzle. The Office Action, in the Response to Arguments p28, indicates that Schuba suggests “a proof of work/puzzle type of solution where a client successfully solving a puzzle implies that whatever the threshold is set as, it has been met or exceeded since the puzzle was completed correctly.” In so stating, the Office Action interprets the description of a client solving a puzzle in Schuba to be the accumulated work value of Claim 16. However, Claim 16 states that the accumulated work value is included in “a request to access a resource **from a user.**” The puzzle solution of Schuba is not included in a request to access a resource from a user. Furthermore, the solution of a puzzle described in Schuba is not sufficient to teach or suggest determining whether an accumulated work value **received from a user** exceeds a required threshold value, as recited by Claim 16. Thus, Schuba fails to teach or suggest the above-cited features of Claim 16. It is not even alleged that French discloses this feature of Claim 16.

The Office Action cites Schuba Col 4 Lines 36-39 for allegedly teaching “providing the user with access to the resource only when the accumulated work value exceeds a required work threshold value” recited by Claim 16. This is incorrect.

As discussed above, Schuba fails to teach or suggest “determining whether the accumulated work value exceeds a required work threshold value” as recited by Claim 16. Thus, it is impossible that Schuba discloses “providing the user with access to the resource **only when the accumulated work value exceeds a required work threshold value**” as recited by Claim 16. Again, it is not alleged that French discloses this feature of Claim 16.

Therefore, for at least the above reasons, Claims 1 and 16 are patentable over Schuba and French, even when taken in combination under 35 U.S.C. § 103(a). Independent Claims 17-19 recite features substantially similar to those of Claim 1, and are thus patentable over the cited art for at least the same reasons as Claim 1. Claims 2, 11, 15, 20, 24, and 28 depend from one of Claims 1, and 17-19 and therefore Claims 2, 11, 15, 20, 24, and 28 include by dependency each of the features described above that distinguish the independent claim from which they depend from Schuba and French. Therefore, Claims 2, 11, 15, 20, 24, and 28 are also patentable over Schuba and French. Reconsideration is respectfully requested.

B. CLAIMS 6-10, 12-14, 21-23, 25-27, AND 29-31

Claims 6-10, 12-14, 21-23, 25-27, and 29-31 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Schuba in view of French and further in view of U.S. Patent No. 7,197,639 to Juels, et al. (“Juels”). The rejection is respectfully traversed. Claims 6-10, 12-14, 21-23, 25-27, and 29-31 depend from one of independent Claims 1, and 17-19, discussed above, and are patentable over the cited references for at least the same reasons as those discussed in connection with the independent claims from which they depend. As is discussed above Claims 1, and 17-19 recites features that Schuba and French do not disclose. The Office Action does not even allege that Juels discloses these features. Therefore, Claims 6-10, 12-14, 21-23, 25-27, and 29-31, which inherit these features, are patentable over Schuba, French, and Juels, even when considered in combination, under 35 U.S.C. § 103(a).

III. CONCLUSIONS & MISCELLANEOUS

For the reasons set forth above, all of the pending claims are now in condition for allowance. The Examiner is respectfully requested to contact the undersigned by telephone relating to any issue that would advance examination of the present application.

A petition for extension of time, to the extent necessary to make this reply timely filed, is hereby made. If applicable, a law firm check for the petition for extension of time fee is enclosed herewith. If any applicable fee is missing or insufficient, throughout the pendency of this

application, the Commissioner is hereby authorized to charge any applicable fees and to credit any overpayments to our Deposit Account No. 50-1302.

Respectfully submitted,

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